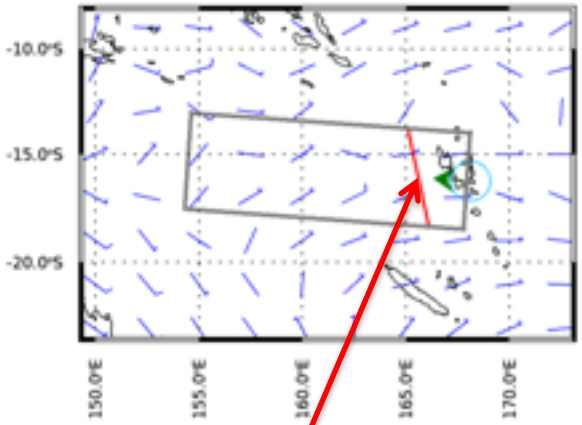
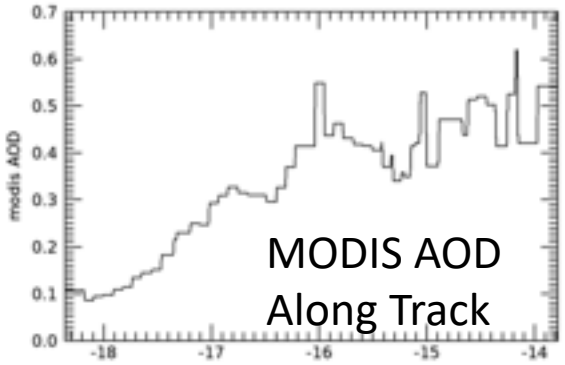
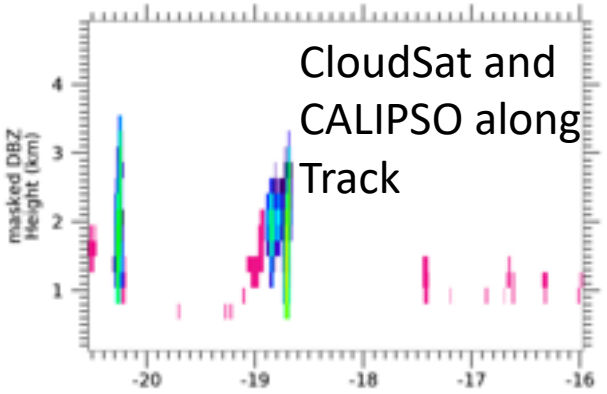
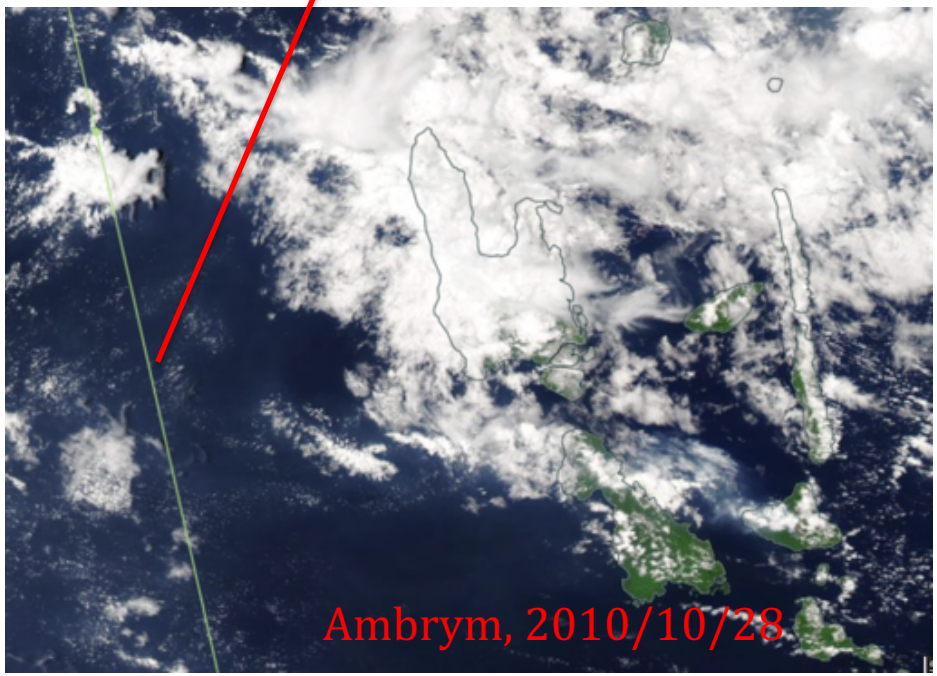
Investigating the influence of volcanic sulfate aerosol on cloud properties using MODIS data along A-Train tracks

Jay Mace and Sally Benson









Objectives: What are the effect of volcanic sulfate aerosol on low cloud cloud properties (macro and microphysical) downstream of active marine volcanoes?

- Insight (Mace and Abernathy, 2016): Because volcanoes erupt episodically in a manner not correlated with the atmosphere, looking at cloud properties in the *downstream plume* minimizes the impact of meteorology and island effect

- Examine 4 years (2007-2010) of A-Train data from 4 volcanoes (**Kilauea, Ambrym, Nishinoshima, Heard Island**

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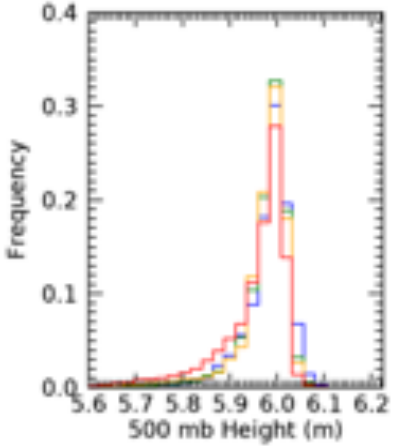
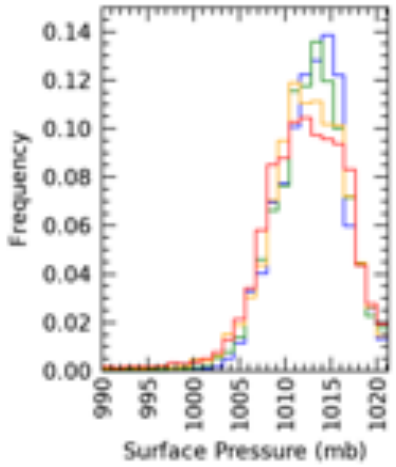
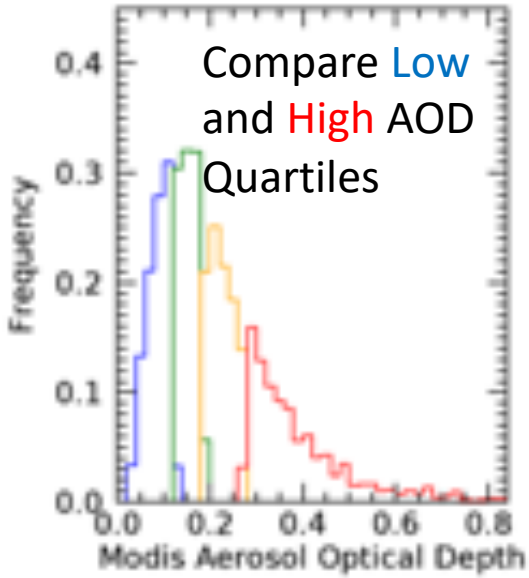
Meteorology is Identical

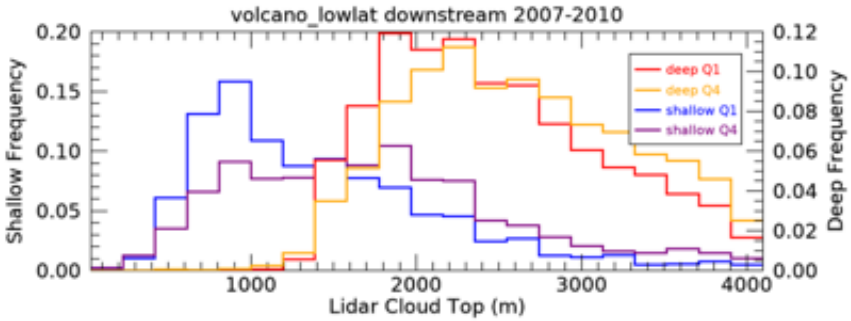




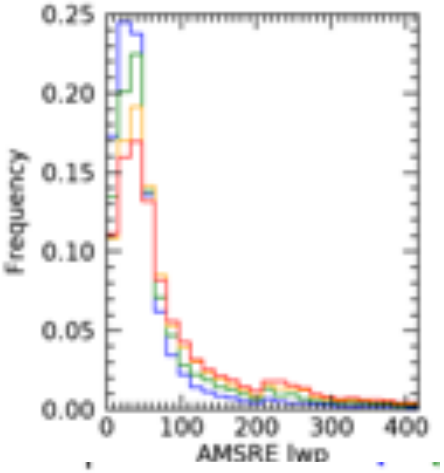
Compare Low and High AOD Quartiles

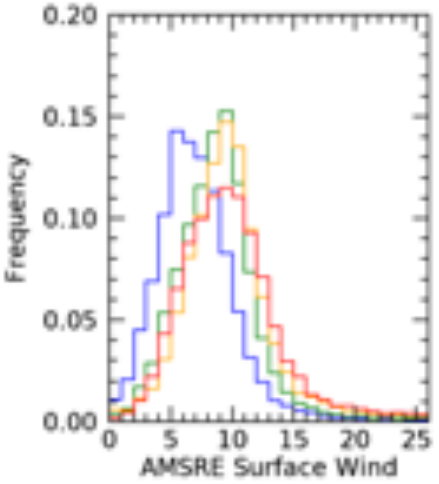


Clouds Are Deeper for High



Water Path and Surface Winds both Stronger for High





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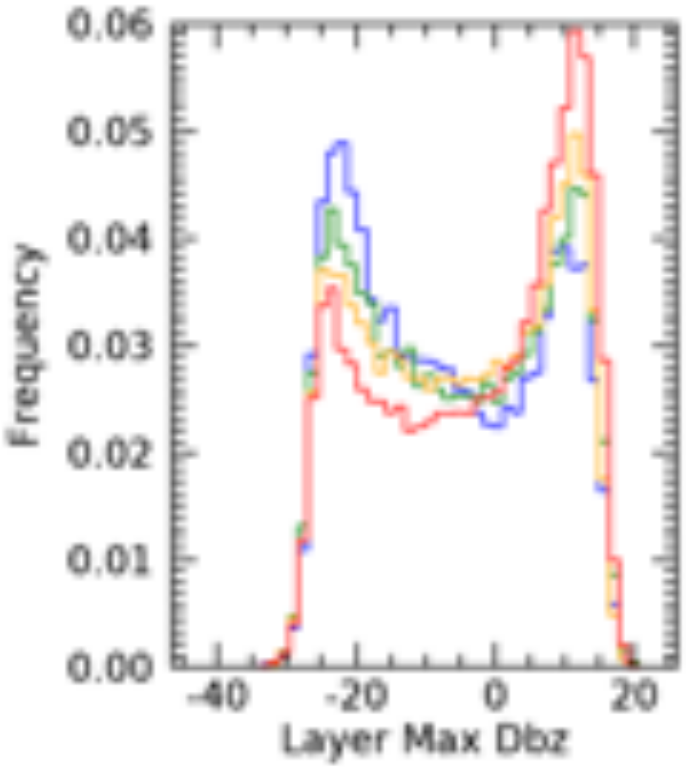
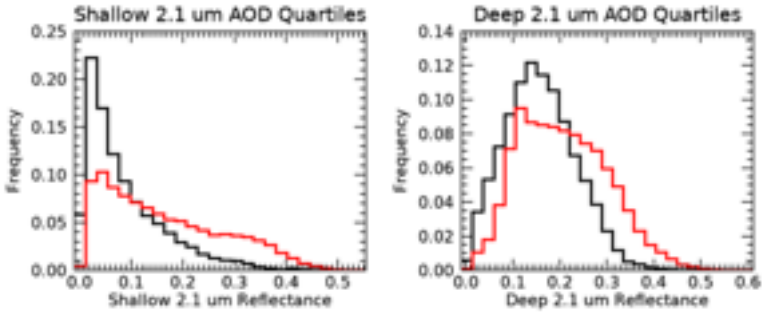
Definite Shift in population for shallow and deep modes of clouds



Shallow mode clouds have lower dBZ in High

Deep mode dBZ is ambiguous for Rain.

The Distribution of reflectance changes dramatically…..



How Do the microphysics change?

We are still working on this but expect to have results completed by the end of 2020.